

REMARKS

Claims 28-37 are currently pending. Claim 28 has been amended. Claims 28-37 currently stand rejected. Applicants respectfully request that the outstanding rejections be reconsidered and withdrawn in light of the claim amendments and remarks presented herein.

Applicants thank the examiner for entering the substitute specification filed June 18, 2003, and accepting the formal drawings filed March 10, 2003.

Regarding claim rejections under 35 U.S.C. § 112, first paragraph

Rejections under 35 U.S.C. § 112, first paragraph, enablement

Claims 28-37 stand rejected under 35 U.S.C. § 112, first paragraph, on grounds that the specification allegedly does not provide enablement for claims to a method of producing plants that are tolerant of temperature extremes by transformation with a nucleic acid encoding the pr17 protein operably linked to an N-terminal extension of SEQ ID NO: 1, or other derivatives of pr17, or a method of using a multitude of DNA molecules that encode a virus-encoded transport protein to produce any and all plant species that are tolerant of drought, fungal infection, salt and temperature.

Applicants traverse these rejections and hereby submit the sworn Declaration under 37 C.F.R. § 1.132 of Dr. Wolfgang Rohde, as Exhibit A.

As to the statement that “the specification provides no evidence that plants transformed with pr17 or any other virus-encoded transport protein are tolerant to extreme temperatures” (Office Action, page 3, lines 10-12), Applicants direct the Examiner’s attention to the Declaration of Dr. Wolfgang Rohde, submitted under 37 C.F.R. § 1.132 (Exhibit A). In Paragraph 4 of the Declaration, Dr. Rohde states:

“Although data on temperature extremes are not explicitly provided in the patent application, I have generally observed that tolerance to drought and extreme temperatures go hand in hand. We have demonstrated that plants transformed with a virus-encoded transport protein are tolerant to drought. Consequently, plants tolerant to drought would be expected to be tolerant to extreme temperatures.” (Exhibit A, page 2, lines 15-20)

As to the statement that “it is unclear that a nucleic acid encoding pr17 + SEQ ID NO: 1 would work in other plants” (Office Action, page 4, lines 2-3), Applicants direct the Examiner’s attention to the Declaration of Dr. Wolfgang Rohde, submitted under 37 C.F.R. § 1.132 (Exhibit A). In Paragraph 5 of the Declaration, Dr. Rohde states:

“Both monocotyledonous and dicotyledonous plants can be transformed by appropriate pr17 or pr17-N constructs and result in transgenic plants with increased tolerance to drought, fungal infections, and extreme temperatures.” (Exhibit A, page 2, lines 23-25)

As to the statement that “the specification is not enabled for use of any nucleic acid other than the one encoding pr17 operably linked to SEQ ID NO: 1” (Office Action, page 4, lines 9-10), Applicants direct the Examiner’s attention to the Declaration of Dr. Wolfgang Rohde, submitted under 37 C.F.R. § 1.132 (Exhibit A). In Paragraph 6 of the Declaration, Dr. Rohde states:

“Other derivatives of pr17 or different movement proteins (MPs) of other plant viruses, whether wild-type or mutant MPs, when expressed in transgenic plants, should confer tolerance to drought, fungal infections, and extreme temperatures.” (Exhibit A, page 3, lines 1-3)

Applicants respectfully submit that the Declaration of Dr. Rohde has overcome the rejections of Claim 28-37 under 35 U.S.C. § 112, first paragraph, with respect to enablement, and these rejections should be withdrawn.

Rejections under 35 U.S.C. § 112, first paragraph, written description

Claims 28-37 stand rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing subject matter that was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s) at the time the application was filed, had possession of the invention. In particular, it is argued that: (a) the specification does not describe the structural features of DNA molecules that encode viral transport proteins other than PLRV pr17 or hydrophilic N-terminal extensions other than SEQ ID NO: 1; and (b) because the sequences are not described, the method of using the sequences are not described (Office Action, page 5, lines 3-6).

Applicants traverse this rejection. “An adequate written description of the invention may be shown by any description of sufficient, relevant, identifying characteristics so long as a person of skill in the art would recognize that the inventor had possession of the claimed invention.” MPEP § 2163.II.A.3(a). ““For some biomolecules, examples of identifying characteristics include a sequence, structure, binding affinity, molecular weight, and length.” MPEP § 2163.II.A.3(a). Applicants point out sufficient, relevant, identifying structural and physical characteristics of plant viral transport proteins are disclosed on page 7, line 23 to page 8, line 2, including citation of references whose content is incorporated by reference (page 1, lines 1-16). The structural and physical characteristics of the viral transport protein pr17 are disclosed on page 8 at lines 7-21 of the specification, which describes an aminoterminal domain for homopolymer formation, a carboxyterminal domain for binding single-stranded amino acids, and plasmodesmatal localization of infection-derived and transgenic pr17 in phloem cells. The specification further discloses that expression of WT and mutated PLRV transport proteins (PLRV-TPs) confers broad-spectrum resistance to viruses and increases in intracellular sugar and starch concentrations (page 8 at lines 21-27). Thus, the specification provides a written description of sufficient, relevant, identifying characteristics such that a person of skill in the art would recognize that the inventor had possession of the claimed nucleic acids and the DNA molecules encompassed by the claims, as required by 35 U.S.C. § 112, first paragraph. Thus the rejection of Claims 28-37 under 35 U.S.C. § 112, first paragraph, with respect to written description, should be withdrawn.

Rejections under 35 U.S.C. § 112, second paragraph

Claims 28-37 stand rejected under 35 U.S.C. §112, second paragraph, as allegedly being indefinite for failing to particularly point out and distinctly claim the subject matter that Applicant regards as the invention. In particular, the terms “increased” and “extreme” in Claim 28 are allegedly indefinite.

Claim 28 has been amended to recite, in step (c), “testing each transgenic plant from step (b) to identify transgenic plants having increased tolerance against drought, fungal infections, increased salt concentrations or extreme temperature in comparison with wild-type plants or transgenic plants not transformed with the nucleic acid which encodes a virus-encoded transport

protein, and showing essentially normal growth” (added material underlined). Applicants respectfully submit that these amendments are sufficient to obviate this claim rejection and request that the rejection be withdrawn.

Claim 29 stands rejected under 35 U.S.C. §112, second paragraph as allegedly indefinite in its recitation of “derivative thereof.” “In reviewing a claim for compliance with 35 U.S.C. §112, second paragraph, the examiner must consider the claim as a whole to determine whether the claim apprises one of ordinary skill in the art of its scope and, therefore, serves the notice function required by 35 U.S.C. §112, second paragraph by providing clear warning to others as to what constitutes infringement of the patent.” MPEP §2173.02. Here, Claim 29 recites the method of Claim 28, wherein the virus-encoded transport protein is the potato leaf roll virus (PLRV) transport protein pr17 or a derivative thereof. One of skill in the art would interpret “a derivative thereof” to include any pr17 derivative which, when expressed in a plant or part thereof, would confer increased tolerance against drought, fungal infections, increased salt concentrations or extreme temperature, and essentially normal growth, according to the method of Claim 28. The specification provides an example of a pr17 derivative having a hydrophilic N-terminal extension. One possessing the ordinary level of skill in the pertinent art at the time the invention was made could make derivatives of pr17 and, following the teachings of the specification, test and identify those pr17 derivatives that fall within the scope of Claim 29. Thus, Claim 29 defines patentable subject matter with a reasonable degree of particularity and distinctness (MPEP §2173.02) and the rejection should be withdrawn.

Claim 28 stands rejected as allegedly indefinite in its recitation of “nucleic acid which encodes a virus-encoded transport protein.” Applicants point out that the specification clearly teaches that the plant is transformed with a nucleic acid that encodes a viral transport protein, *inter alia*, on page 1, lines 10-11: “[t]he nucleic acid preferably codes for a virus-encoded transport protein.” Therefore, Claim 28 defines the patentable subject matter with a reasonable degree of particularity and distinctness (MPEP §2173.02) and the rejection should be withdrawn.

Rejections under 35 U.S.C. § 102

Claims 28-29 and 32-37 stand rejected under 35 U.S.C. § 102(b) as anticipated by Lucas (WO 97/06669). Lucas allegedly discloses a method of producing tobacco plants by transformation with nucleic acids encoding the wild-type or mutant movement protein of tobacco mosaic virus (TMV).

Claim 28 has been amended to recite a method "wherein the virus-encoded transport protein is not tobacco mosaic virus (TMV) movement protein or a derivative thereof" thereby rendering this rejection moot.

CONCLUSION

Claims 28-37 are pending in the present application and currently stand rejected. Claim 28 has been amended. Applicants request that Claims 28-37 be reconsidered in light of the amendments and remarks presented herein, and found in condition for allowance.

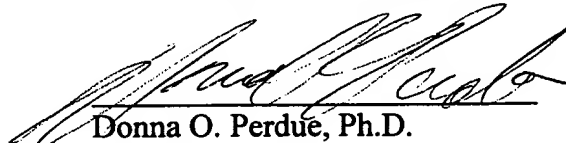
If the Examiner would like to discuss any matters related to this application, Applicants' representative can be reached at (858) 509-4093.

Applicants believe no fee is due. However, if any fees are due in connection with this submission, please charge any such fee or credit any overpayment to Deposit Account No. 50-2212.

Respectfully submitted,

PILLSBURY WINTHROP LLP

Date: Sept 30, 2003


Donna O. Perdue, Ph.D.
Reg. No. 51,166

Please send all correspondence to:
11682 El Camino Real, Suite 200
San Diego, CA 92130
Facsimile: (858) 509-4010
Direct Line: (858) 509-4093